THE CO-INGESTION OF ALCOHOL AND MEPHEDRONE - AN EMERGING CAUSE OF ACUTE MEDICAL ADMISSIONS IN YOUNG ADULTS AND A POTENTIAL CAUSE OF TACHYARRHYTHMIAS.

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INTRODUCTION

Over the past year hospitals in the United Kingdom have seen a number of party-going youths and young adults admitted to Emergency departments following ingestion of mephedrone. Mephedrone is a synthetic stimulant that produces effects similar to that of amphetamines (1,2). Until recently this popular drug belonged to a group of substances commonly termed ‘legal highs’ and was widely available and easily obtained under the guise of plant food from various internet sites and ‘head shops’(3,4). It is a relative newcomer on the UK drug scene, however the early months of 2010 saw escalating publicity and public concern centred around several tragic young deaths which were linked to the drug(5). In April this year rapidly enforced legislation lead to the re-classification of mephedrone under the United Kingdom Misuse of Drugs Act of 1971. Street names include “m-cat”, “drone”, “meow meow”, “mephi” and “moonshine”.

Key Words: Mephedrone, Alcohol, Young Adults, Supraventricular Tachycardia.

CASE REPORTS

Here we present the cases of two young adults admitted in December 2010 following the concurrent ingestion of 'moonshine' (mephedrone) and alcohol. In both cases there were no significant past medical problems and no prescribed medications. Neither required more intervention than simple
observation and intravenous rehydration. Recovery was rapid with discharge the following day.

Case 1: An 18 year old female admitted following ingestion of an unknown quantity of 'moonshine' whilst at a house party. She had been drinking heavily and shortly after taking the substance she felt acutely unwell with visual hallucinations.

On admission she was intoxicated and confused with a Glasgow Coma Score (GCS) of 14/15. Observations were as follows: Heart Rate; 150 beats per minute, Blood Pressure; 140/60mmHg, Peripheral Oxygen Saturations; 97% on air, Respiratory Rate; 23 breaths per minute, Temperature; 36.1°C, Bedside Glucose test; 7.7.

ECG showed supra-ventricular tachycardia (SVT) with a ventricular rate of 161 beats per minute. Blood tests confirmed a raise blood alcohol level but were otherwise normal.

Recovery was uneventful with return to GCS 15/15 and spontaneous resolution of the SVT within five hours, she was discharged following twelve hours of observation. No follow up was required.

Case 2: A 21 year old male admitted following ingestion of an unknown quantity of 'moonshine' whilst at a friend’s house. The patient had been drinking heavily and had no recollection of the events leading to admission.

On admission he was initially drowsy with a GCS of 11/15, however this quickly improved to GCS of 15/15 over one hour. Observations were as follows: Pulse Rate; 160 beats per minute, Blood Pressure; 110/55, Peripheral Oxygen Saturations; 96% on air, Respiratory Rate; 16 breaths per minute, Temperature; 36.2°C, Bedside Glucose Test; 5.7.

ECG showed SVT with a rate of 168 beats per minute. Blood tests confirmed a raised blood alcohol level but were otherwise normal.

DISCUSSION

Mephedrone has no licensed medicinal purposes and is thought to have been introduced into the UK approximately three years ago (6). Throughout 2009 it became popular on the UK drug scene, with the majority of users being introduced to mephedrone in the latter months of 2009 and early 2010 (7,8,9). This explosion of popularity was most notable amongst young adults and was accompanied by growing concern about the unpredictable and potentially dangerous effects of this drug. Outbreaks in numerous areas culminated in increasing hospital admissions and an ever growing number of teenage deaths supposedly linked with the substance. Similar tragedies observed worldwide had already prompted many countries including Ireland, Sweden, Germany, Denmark and certain US states to recently ban the substance. In April 2010 the UK followed suite and re-classified mephedrone
as a Class B drug, it now carries a potential five year sentence for possession and fourteen year sentence for dealing.

Little data exists regarding the chemical, pharmacological and toxicological properties of mephedrone. It is a semi-synthetic compound with the chemical name 4-methylmethcathinone (4MMC), derived from cathinone, a potent sympathomimetic monoamine alkaloid found in the East African plant *Katha edulis* (Khat) (1,2). Khat leaves are known to induce a state of stimulation and euphoria, and are chewed in a centuries old tradition throughout the Middle East and East Africa. Cathinone is a powerful stimulant and is structurally similar to the amphetamines, however differs in that it contains a functional ketone group and is often therefore referred to as a keto-amphetamine (1). Mephedrone is thought to be largely manufactured by laboratories in the Far East from where it is imported on a large scale.

Social research has shown that those who use mephedrone tend to be habitual users of other illicit drugs including cocaine, ecstasy and amphetamines (3,7,8,10). The drug is widely consumed in the setting of house parties and night clubs and therefore a significant number of young people are at risk. Due to its recent legal status mephedrone is often also perceived as less harmful than more conventional alternatives (3,7,9). Mephedrone in the recent past was affordable, with a typical 'dose' in a nightclub costing approximately £3, adding to its allure bulk buys were also acquired easily and cheaply via numerous internet sites where it was advertised as plant food (3,7,8). Evidence collected since April 2010 shows mixed reports as to whether illegalisation has reduced mephedone usage however does suggest that a market for illegal trade now exists with prices double that of previously (11,12).

Mephedrone is available as a white powder or in tablet form, and is generally consumed orally. Onset of action is reported to occur at 20 to 40 minutes and the duration of effects from a single dose may range from two to four hours (7,9,10). Some users report 'sniffing' the substance which results in more rapid onset of symptoms (7,8,10).

Evidence regarding the physical effects of mephedrone is largely anecdotal and collected from small scale surveys or internet chat forums. Many revellers relate the effects as being similar to that of other stimulant drugs and often claim they are superior (7,9,10,13). Psychological effects of mephedrone are varied but may include mental stimulation, rapid 'head rushes', intense euphoria, excess energy, increased empathy and sociability, hallucinations, increased sexual drive, amnesia and delusions. A survey conducted by the National Addiction Centre reported the predominant physical symptoms to be; headaches 53%, palpitations 43%, nausea 28% and cold or blue fingers 15%. In addition light-headedness, nose bleeds, blurred vision, dilated pupils, dry mouth, muscle spasms and uncomfortable changes in body temperature have also been reported (7,10). Many users describe a prolonged period of insomnia persisting long after the other effects. Lastly
mephedrone does appear to have addictive properties with many reporting a desire to re-dose, intense cravings and daily usage (7,8,9,10).

Despite the wide spread use of mephedrone surveys appear to conclude that the majority of users experience fairly minimal negative effects and will not require medical attention (7,8,9,10). However despite this hospitals nationwide have seen large numbers of admissions resulting from reduced conscious level, palpitations, tachyarrhythmia’s, circulatory problems, panic attacks, nose bleeds and other physical consequences of concurrent alcohol and ingestion of mephedrone(14,15,16).

Detection of mephedrone ingestion in the medical admissions unit may be problematic due to lack of an accurate history in intoxicated or drowsy individuals, an unwillingness to disclose information or a genuine unawareness of the substance/substances taken. Certain specialist centres have begun developing methods for detection of urinary derivatives using mass spectrometry, however these tools are not widely available (16,17).

CONCLUSION

In conclusion mephedrone represents a serious social problem. Our case reports illustrate that the effects of mephedrone in previously healthy individuals, especially when ingested alongside large quantities of alcohol, may lead to cardiac dysrhythmias. When young adults are admitted to Emergency Departments with alcohol intoxication, concurrent ingestion of mephedrone should always be considered, especially in those with cardiac dysrhythmias.

The evidence presented here together with a string of recent acute medical admissions and tragic deaths serves to remind us that there is a current lack of scientific understanding surrounding the acute effects of this drug, and that they may be highly unpredictable. It is hoped that mephedrones new status as a Class B drug will curb its escalating popularity and dispel beliefs that it is may be a ‘safer’ way to obtain a high. Lastly it is hoped that the publicity surrounding mephedrone will raise awareness among users and clinicians regarding the potential dangers of so call ‘legal highs’, both those in current circulation and those yet to be synthesised.

REFERENCES
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